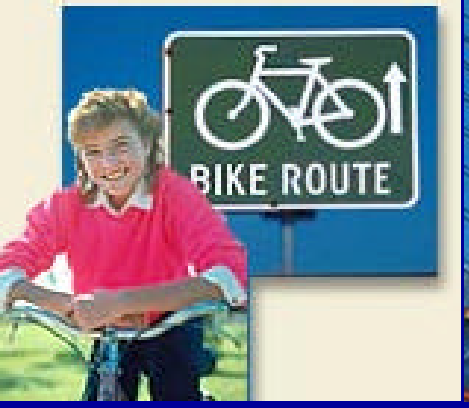
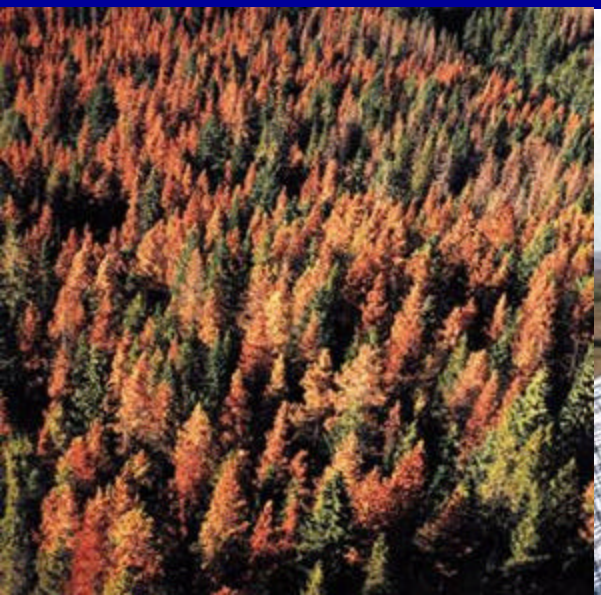



Climate Disruption

Science, solutions and prospects for local leadership



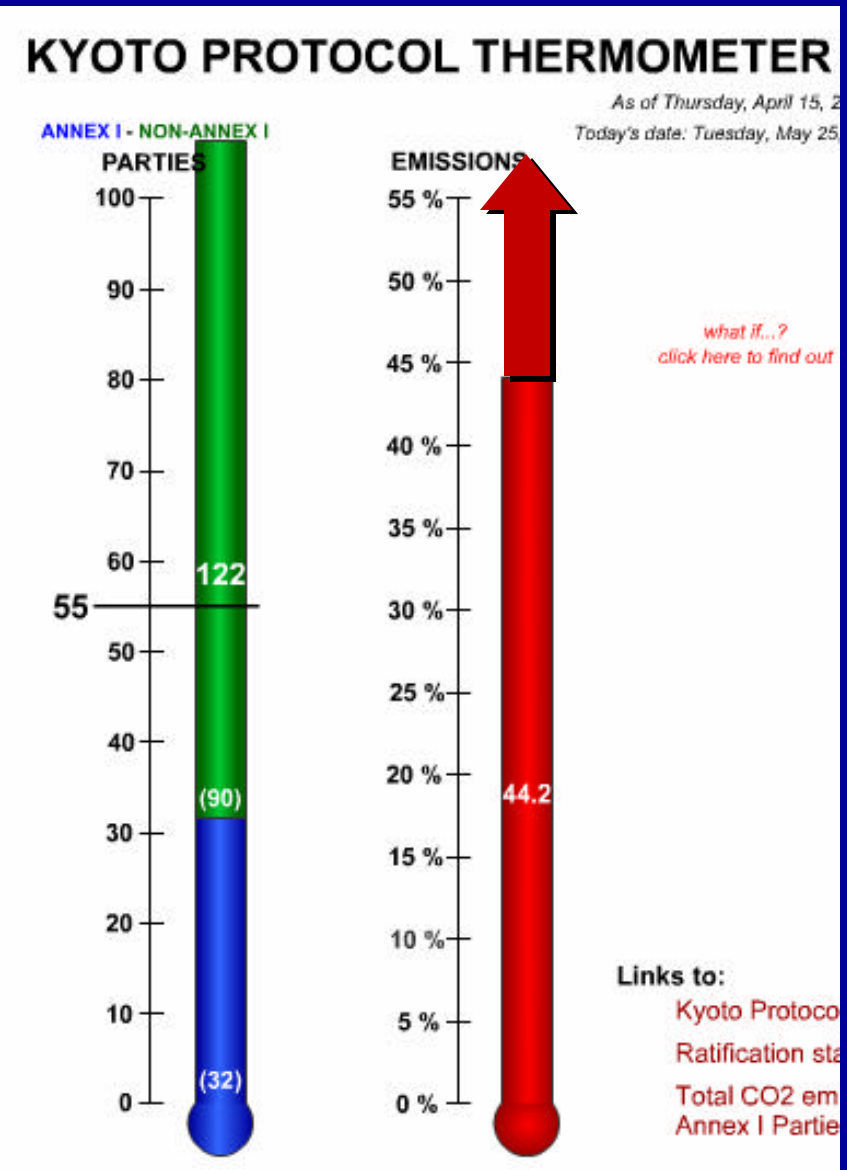

Green Ribbon Commission

March 29, 2005

Climate Solutions

Signs of change…..

Kyoto: The developed world turns toward solutions… without the U.S.



- Took effect Feb. 16
- EU emission trading market is open
- Carbon limits are a fact of global commerce

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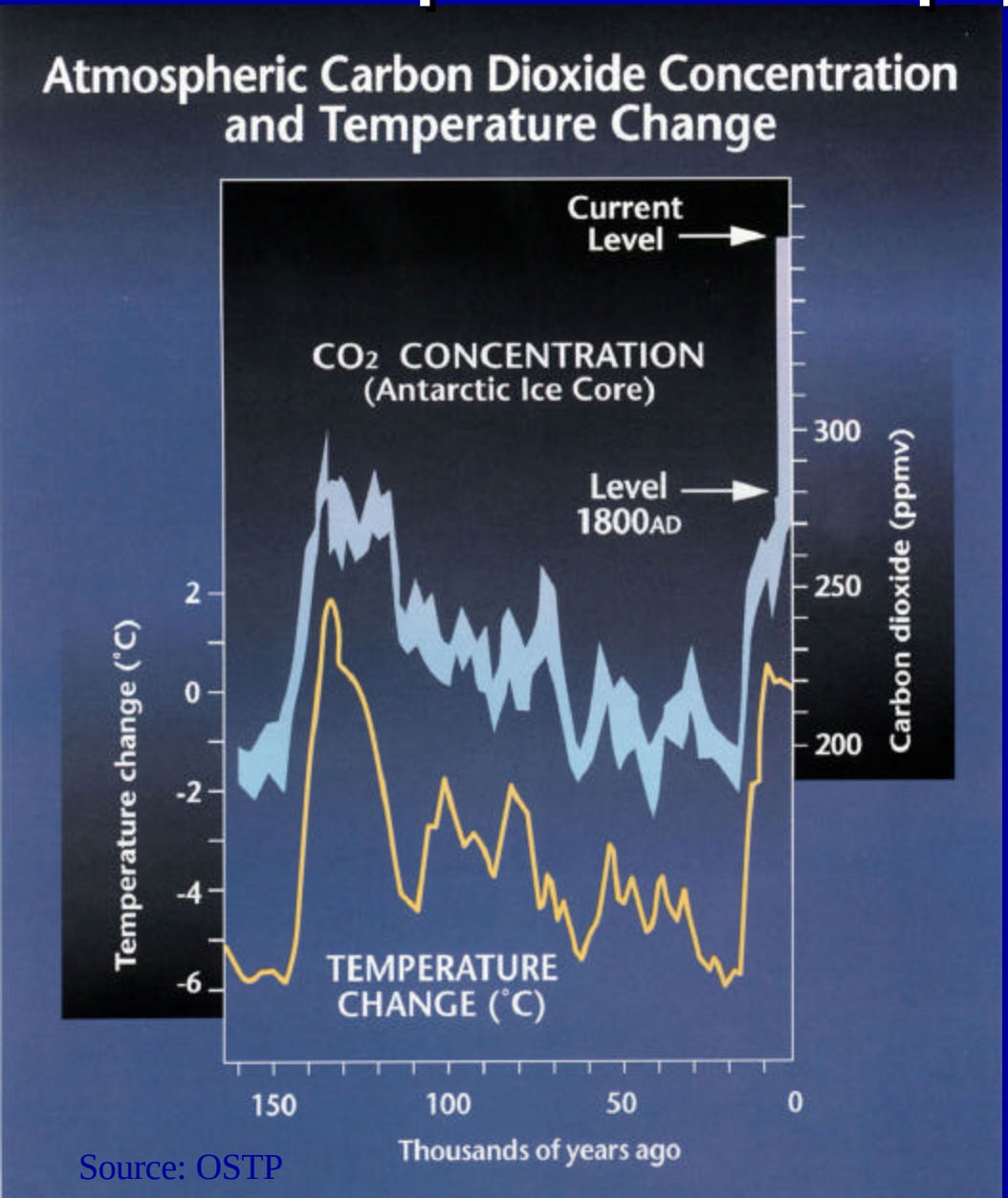
Scientific consensus is robust:
928 peer-reviewed papers; zero dissent



Source: OSTP

- Clear correlation between CO_2 and temperature
- Current level of CO_2 is *outside* bounds of natural variability
- *Rate* of change in concentration of CO_2 is unprecedented

Climate Solutions

Seattle Times 12/1/04:

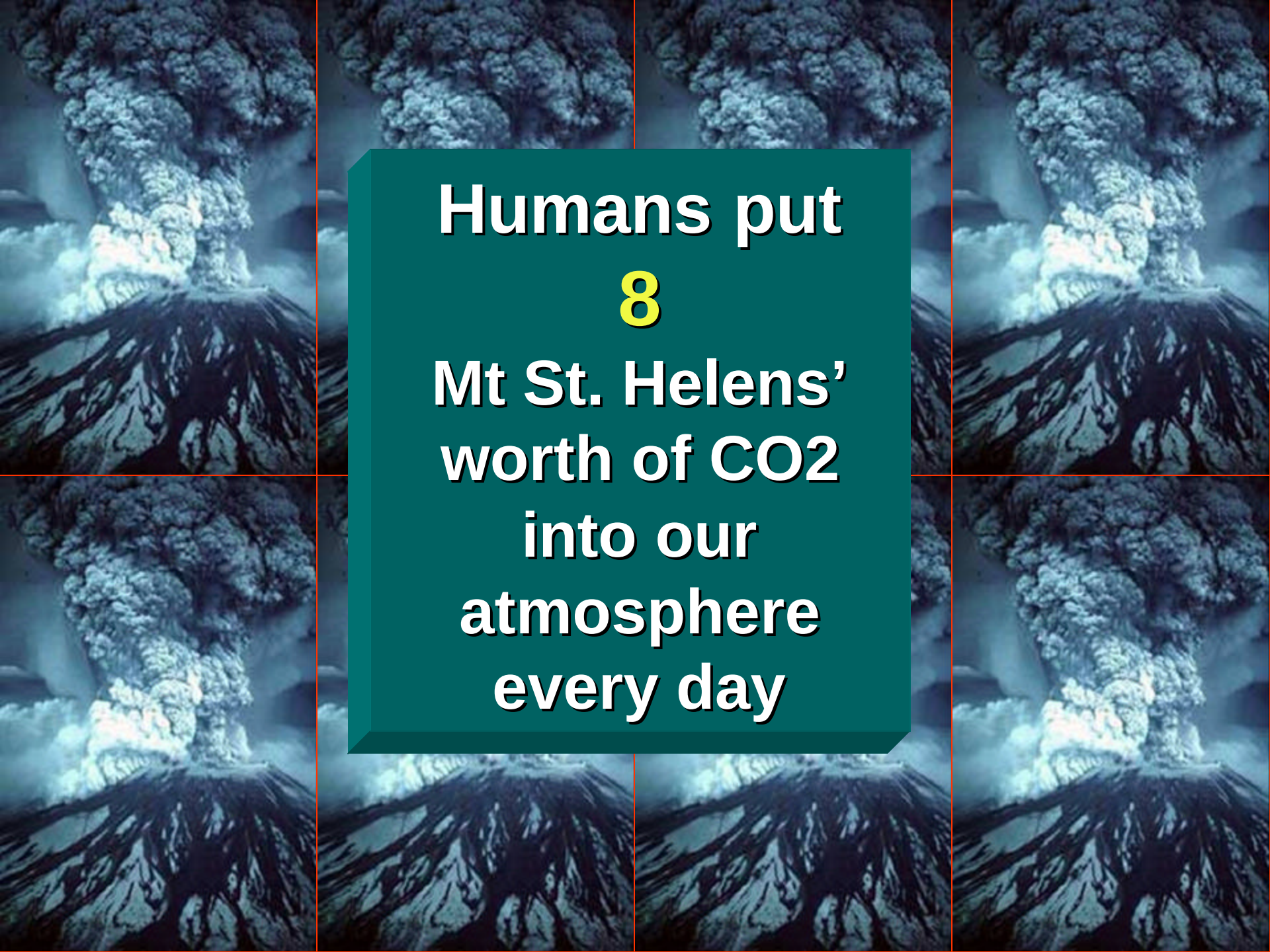
Mount St. Helens the state's No. 1 air polluter

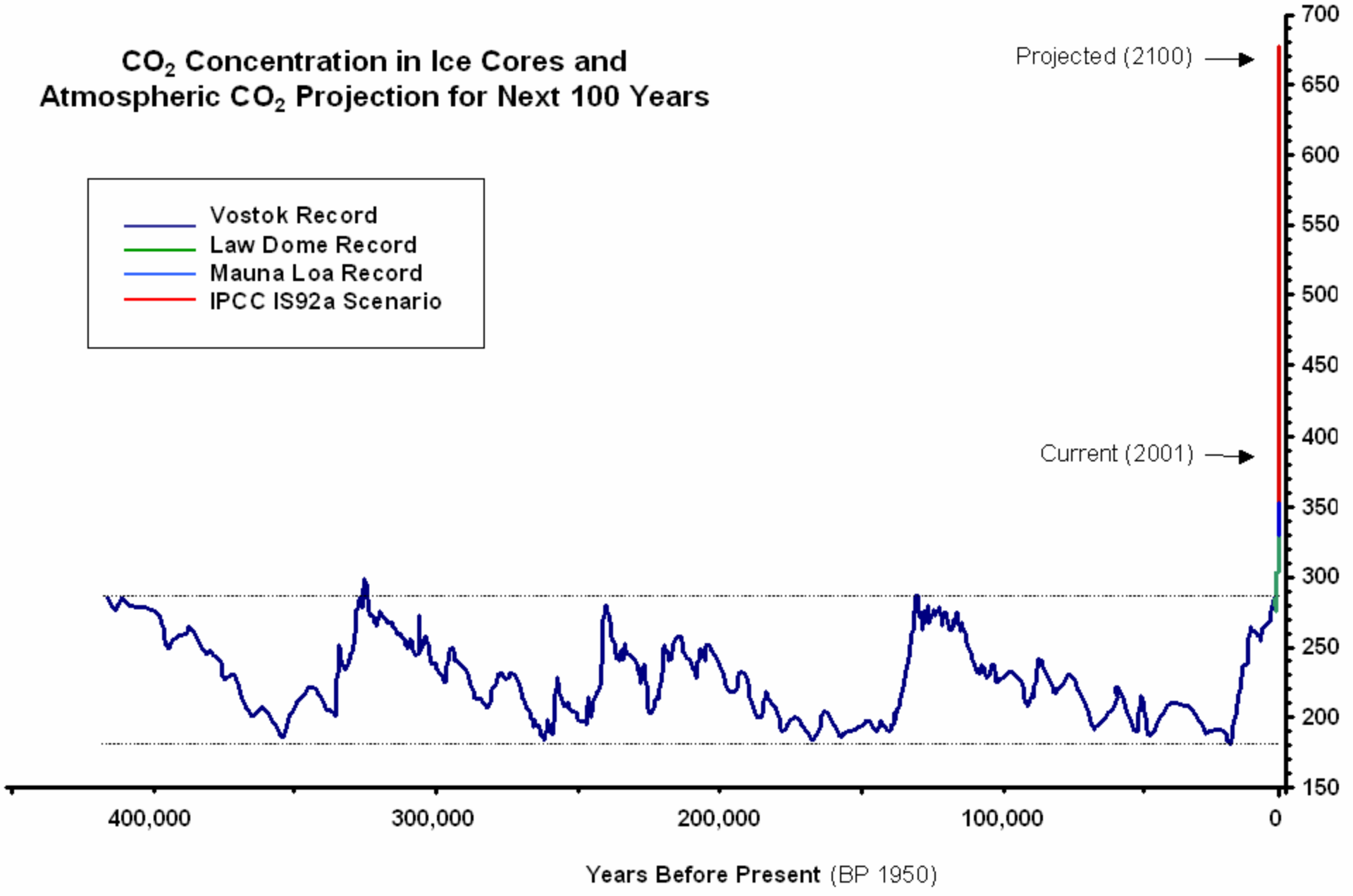
Front page: "The biggest single source of air pollution in Washington isn't a power plant, pulp mill or anything else created by man. It's a volcano."

p. A18: "Compared to man-made sources, though, volcanoes' contribution to climate change is minuscule"

- **CO_2 from Mt. St. Helens: up to 1000 tons per day**
- **CO_2 from Centralia coal plant: 28,000 tons per day**
- **CO_2 from motor vehicles in WA: 148,000 tons per day**
- **CO_2 from all energy sources in WA: 270,000 tons/day**

Data sources: Washington CTED and Seattle Times 12/1/04

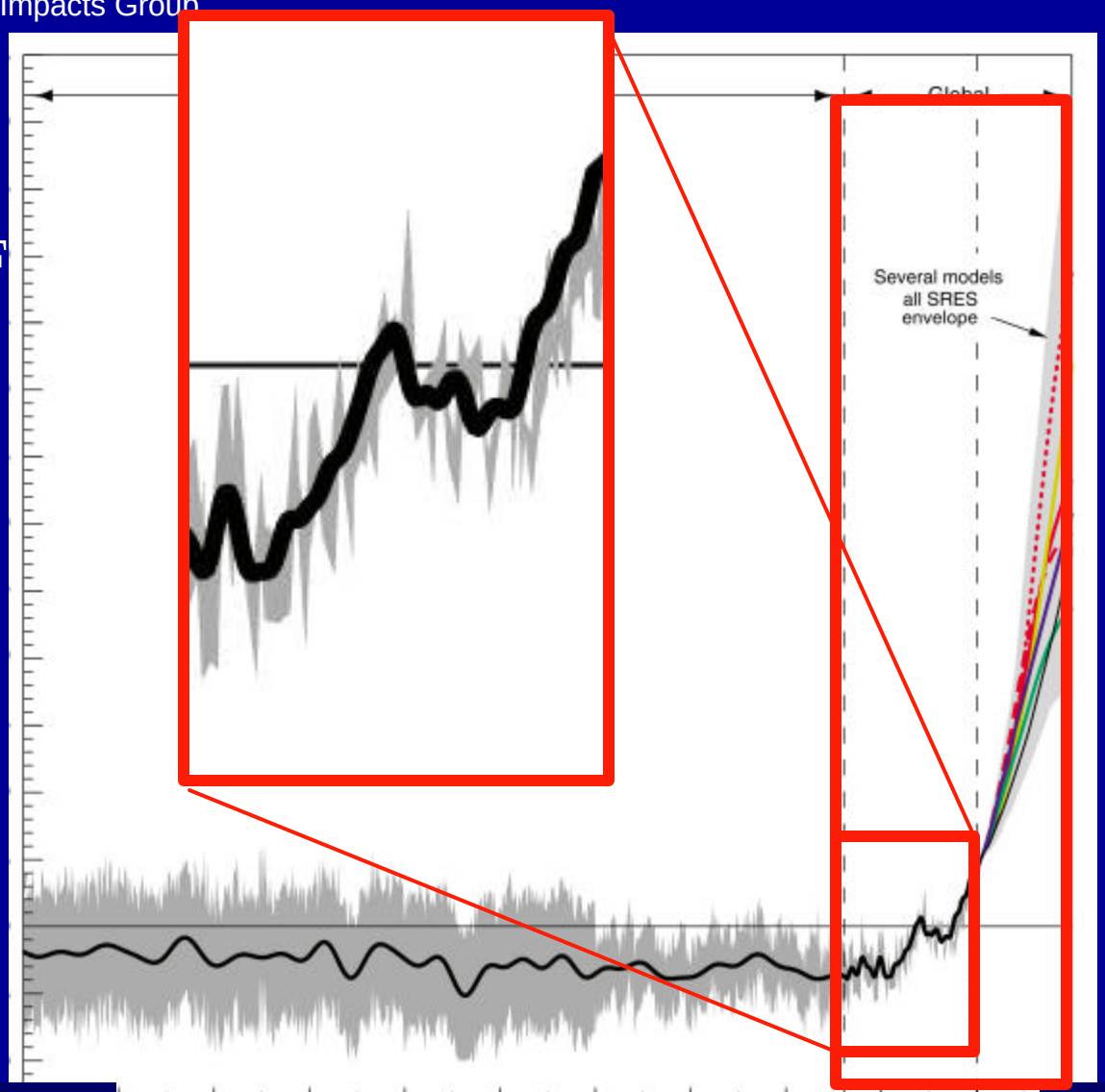

Humans put
8
Mt St. Helens' worth of CO2 into our atmosphere every day



Source: C. D. Keeling and T. P. Whorf; Etheridge *et.al.*; Barnola *et.al.*; *(PAGES* / IGBP); IPCC

Global temperature: 1000 years back, 100 forward

Source: IPCC TAR 2001
UW Climate Impacts Group



From 1900 to 2000 the planet warmed ~1°F.

Global average temperature projected to increase 2.5-10.4°F by 2100.

But nobody lives in the global average temperature

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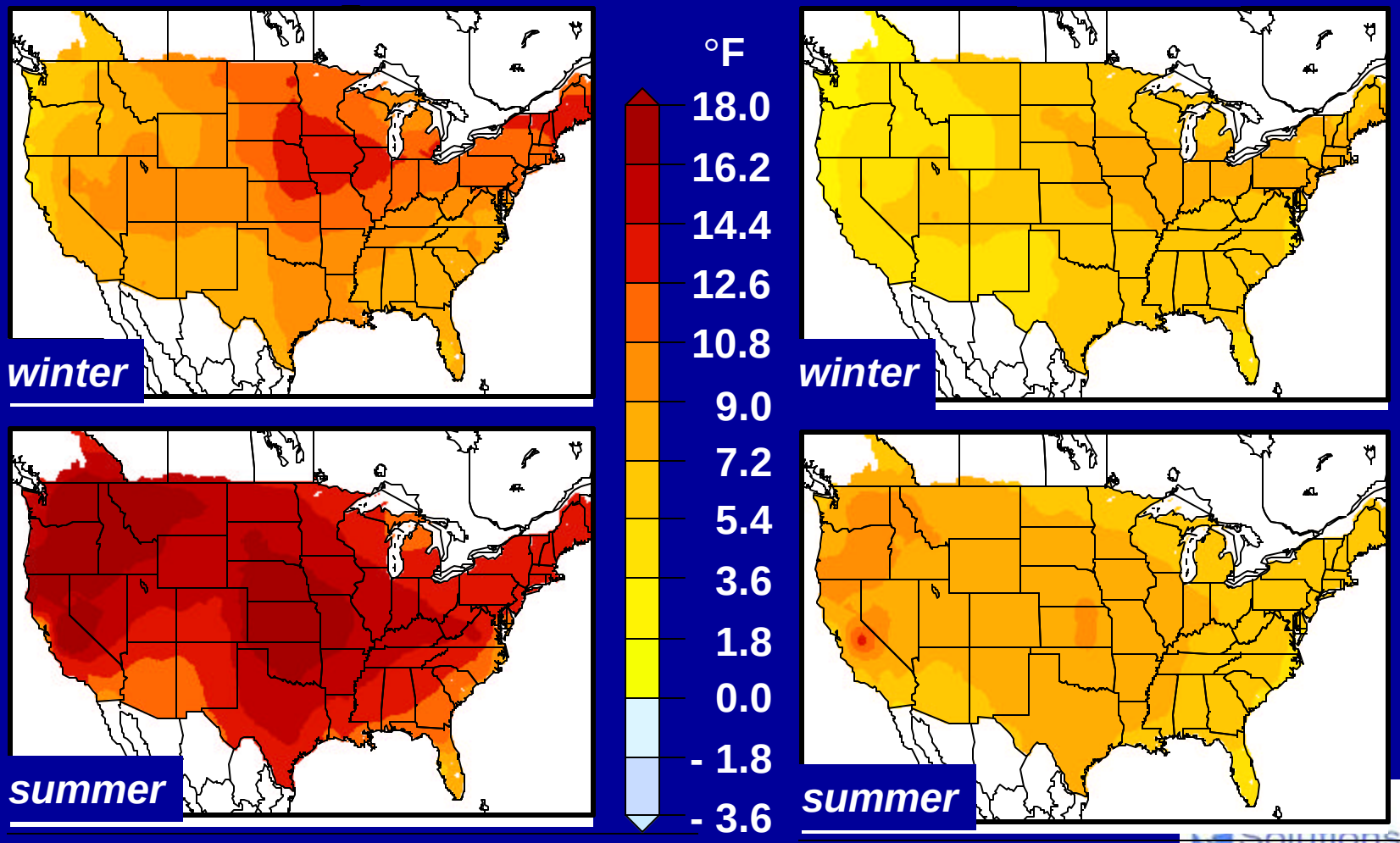
Projected Temperature Increase

21st Century

HIGHER EMISSIONS

LOWER EMISSIONS

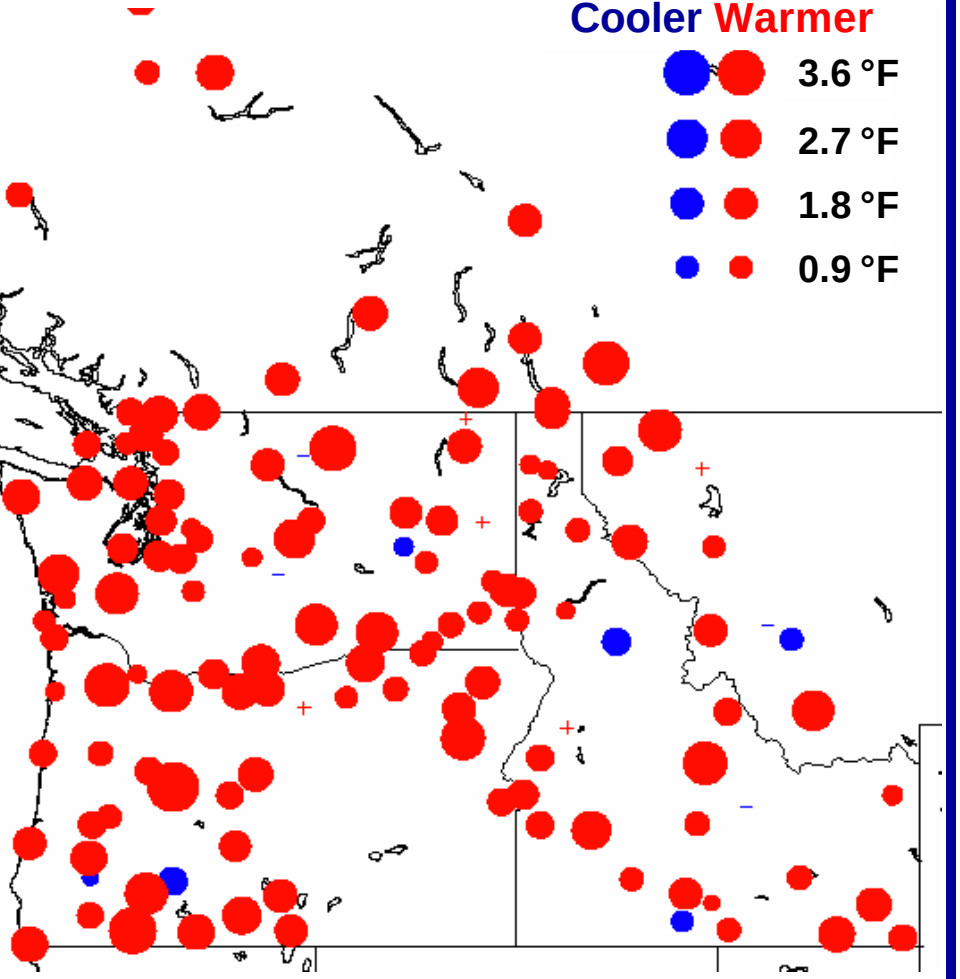


Notes: HadCM3 model results for 2070-2099 vs. 1961-1990. Higher emissions = A1fi; lower emissions = B1 scenarios from IPCC Third Assessment Report. Downscaled results from E. Maurer (http://www.engr.scu.edu/~emaurer/index.shtml).

Observed PNW Trends

TEMPERATURE

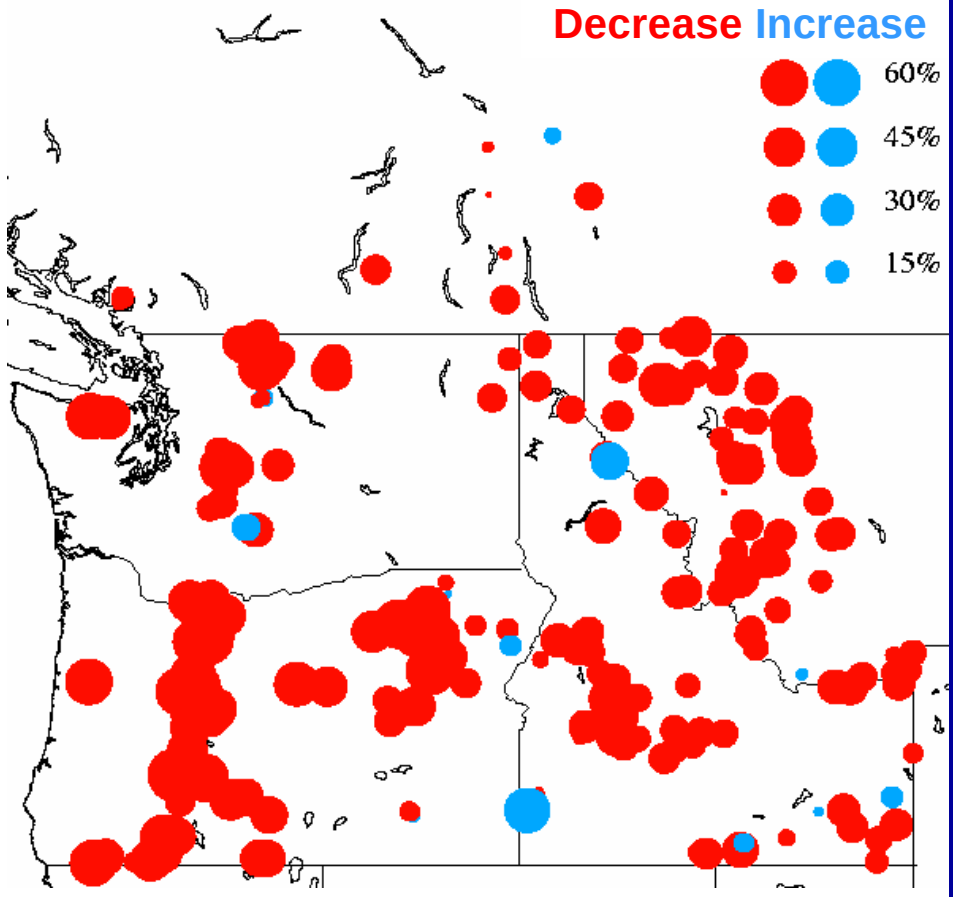
(°F per century, since 1920)



Source: Mote 2003a.Courtesy of UW Climate Impacts Group.

SNOWPACK

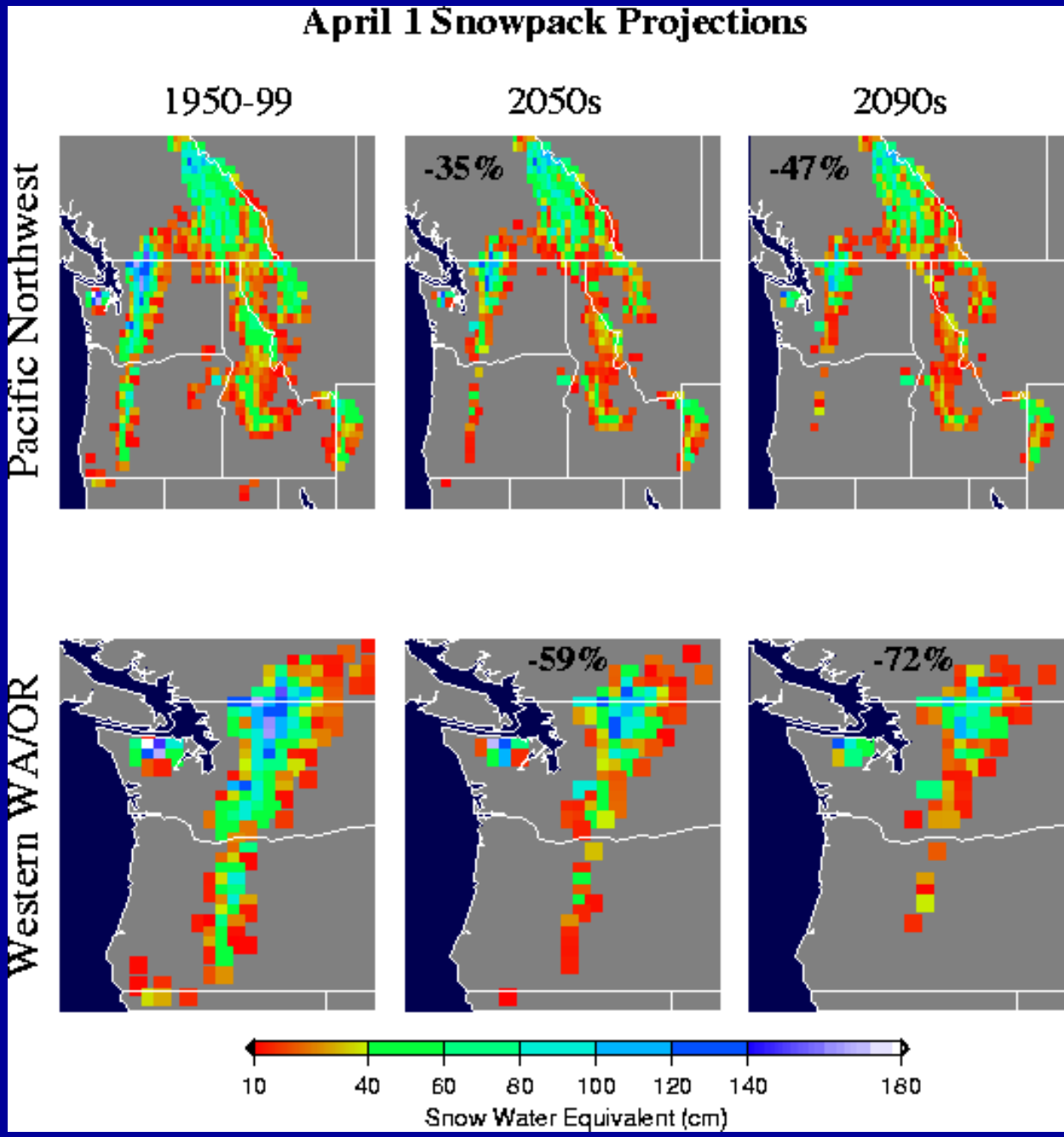
(Change 1950-2000, April 1)



Source: Mote 2003b. Courtesy of UW Climate Impacts Group.

NW Impacts: Snowpack loss

Western Washingon and Oregon are especially sensitive



Climate disruption and salmon

- **Increased winter flooding – habitat destruction**
- **Decreased summer and fall streamflow**
- **Higher stream and ocean temperatures**

"For the factors we can simulate with some confidence, the prospects for many PNW salmon stocks look bleak"

- UW Climate Impacts Group

Climate disruption and forests

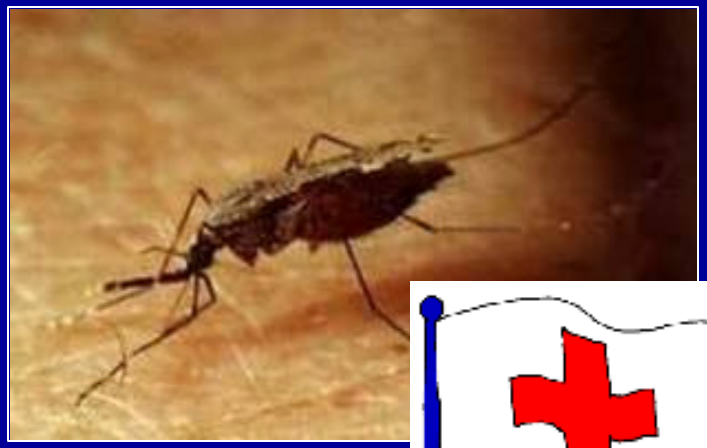
“Disturbances”: pests, diseases, fires

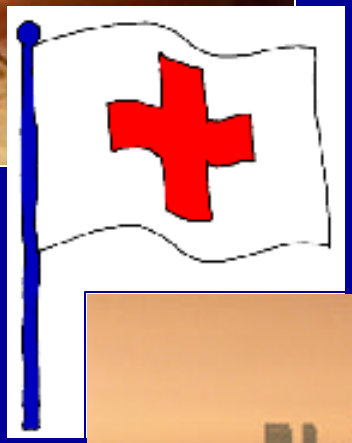
Permanent loss of some forests after disturbance

Mild winters and warm summers are the main cause of the outbreak – David Suzuki Foundation

Climate Solutions

Climate disruption and health





“It's not only going to be a warmer world, it's going to be a sicker world.”

Andrew Dobson, Princeton epidemiologist

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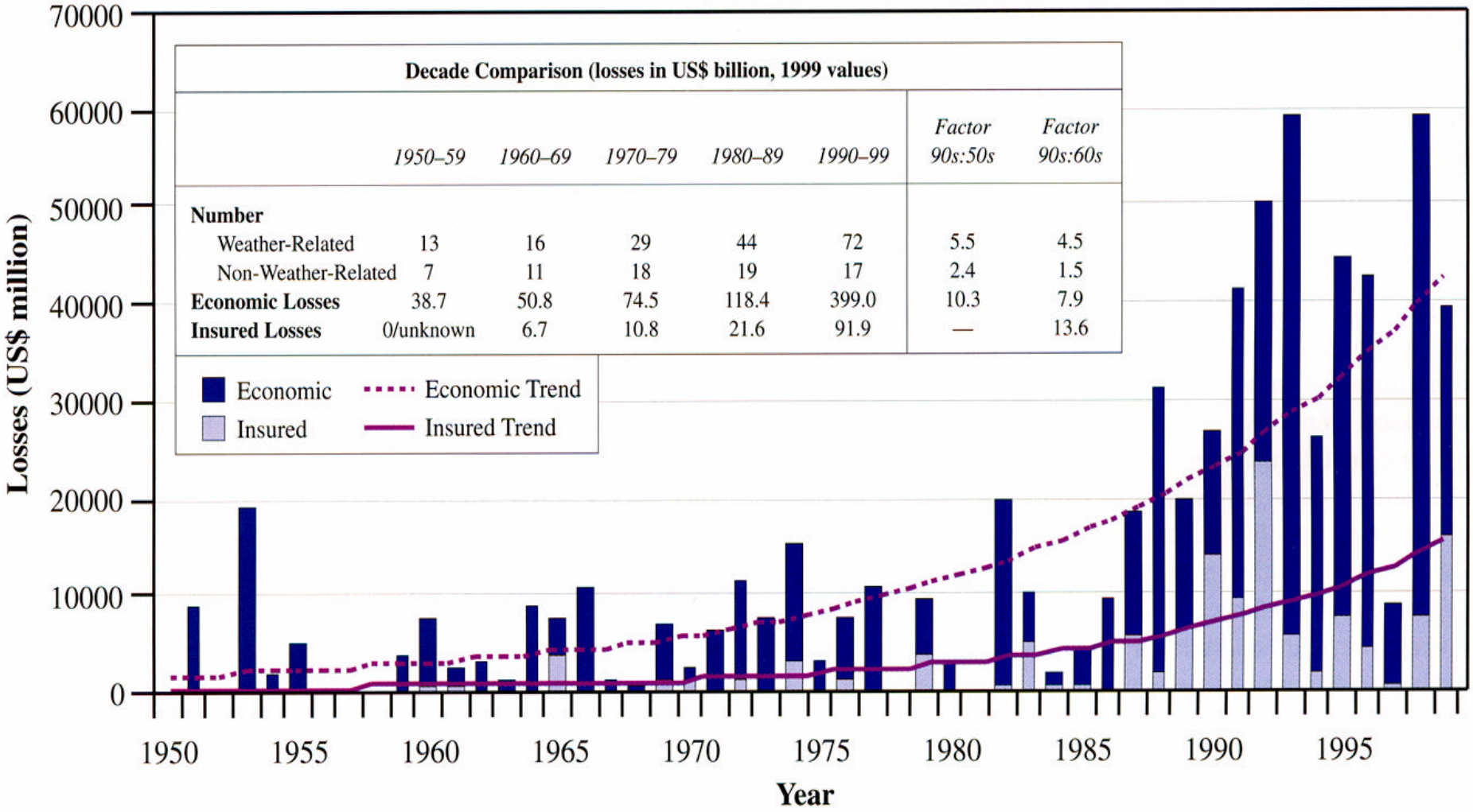
Financial costs of extreme weather events – Insured losses



Decade Comparison (losses in US$ billion, 1999 values)

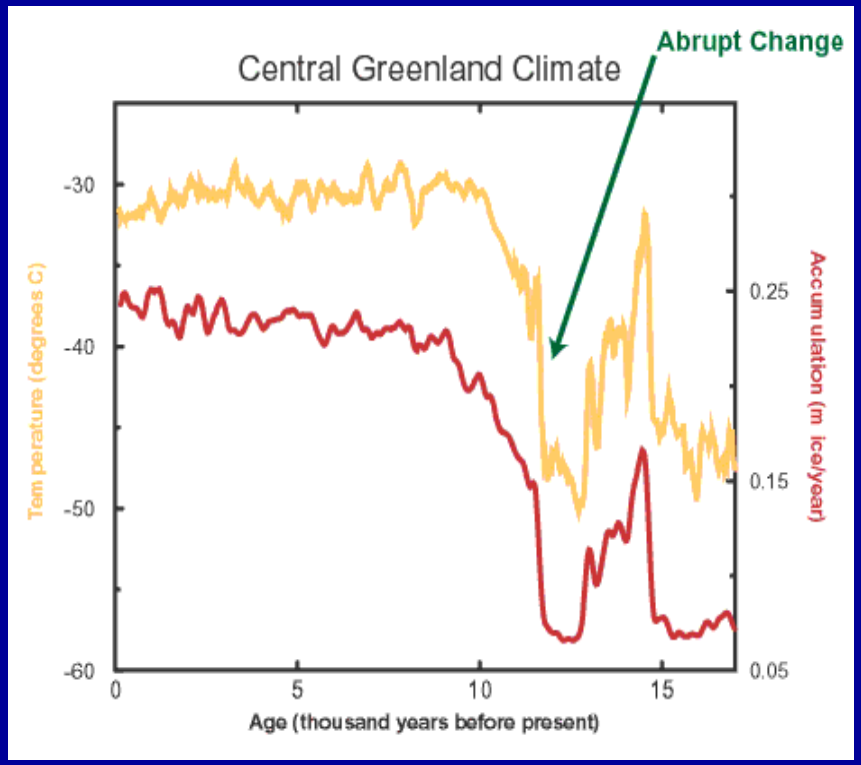
	1950–59	*1960–69*	*1970–79*	*1980–89*	*1990–99*	*Factor 90s:50s*	*Factor 90s:60s*
Number							
Weather-Related	13	16	29	44	72	5.5	4.5
Non-Weather-Related	7	11	18	19	17	2.4	1.5
Economic Losses	38.7	50.8	74.5	118.4	399.0	10.3	7.9
Insured Losses	0/unknown	6.7	10.8	21.6	91.9	—	13.6

Figure TS-5: The costs of catastrophic weather events have exhibited a rapid upward trend in recent decades. Yearly economic losses from large events increased 10.3-fold from US$4 billion yr^{-1} in the 1950s to US$40 billion yr^{-1} in the 1990s (all in 1999

Science Fiction: The Day After Tomorrow

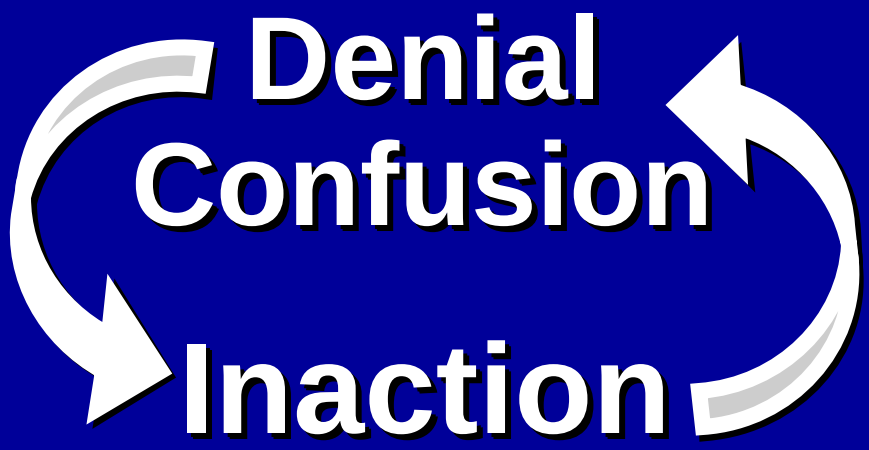
Science: "Abrupt climate change: inevitable surprises" – National Research Council, 2002

- We don't know probabilities or triggers.
- Uncertainty argues for prompt action.
- Adaptation requires stabilization.



Fortune, 2/9/04: "Climate collapse: The Pentagon's worst nightmare"

Climate Solutions



“I don’t think this is a big issue, because nobody’s doing anything about it.”

We can break the circle with:

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Approaching the Tipping Point:
Clean energy transition drivers

- Energy independence and security

- Economics/Technology
  - Fossil fuel prices high, volatile
  - Clean energy coming of age

- Climate disruption:
  Environmental necessity drives economic opportunity

Businesses are positioning

“Business leaders say climate change is our greatest challenge”

-World Economic Forum Press Release

NYT: "The warming is global, but the legislating, in the U.S., is all local" Why are states and cities acting?

- Environmental imperative
- Leadership vacuum
- Economic opportunity – positioning for prosperity in a low-carbon economy
- …..and they're big!

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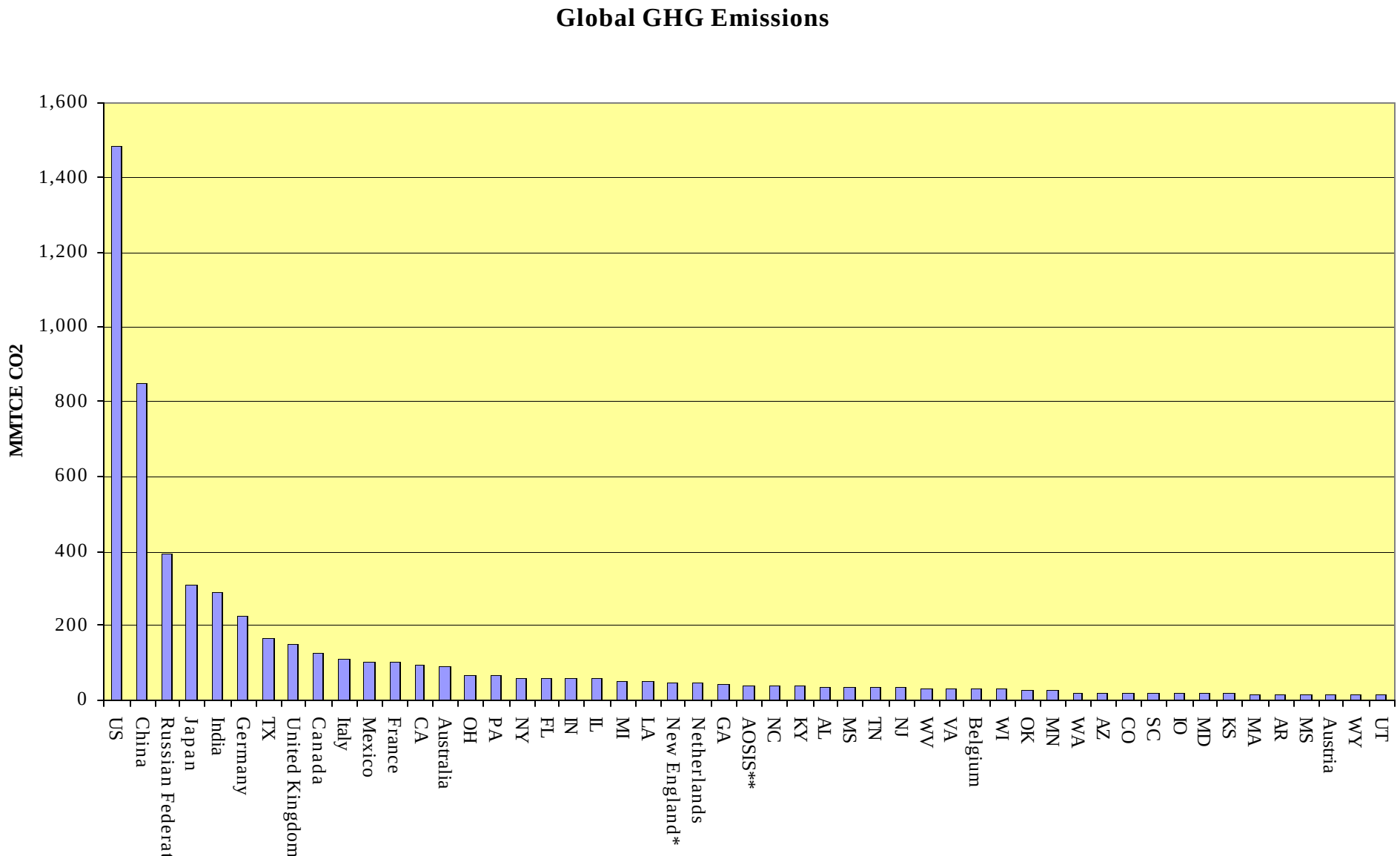
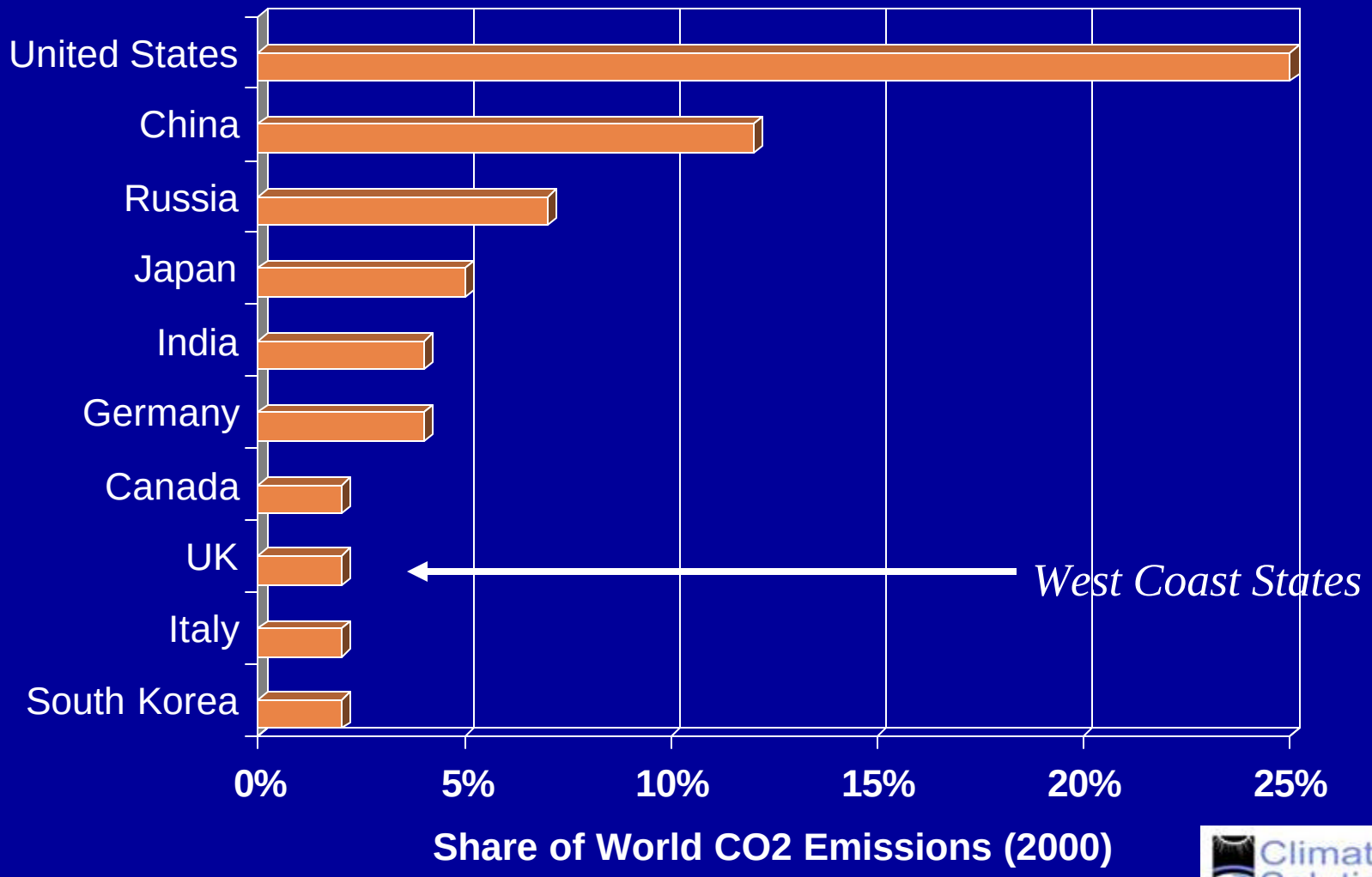
States are players

Top 50 Global GHG Emitters



World's Top 10 CO_2 Emitters:



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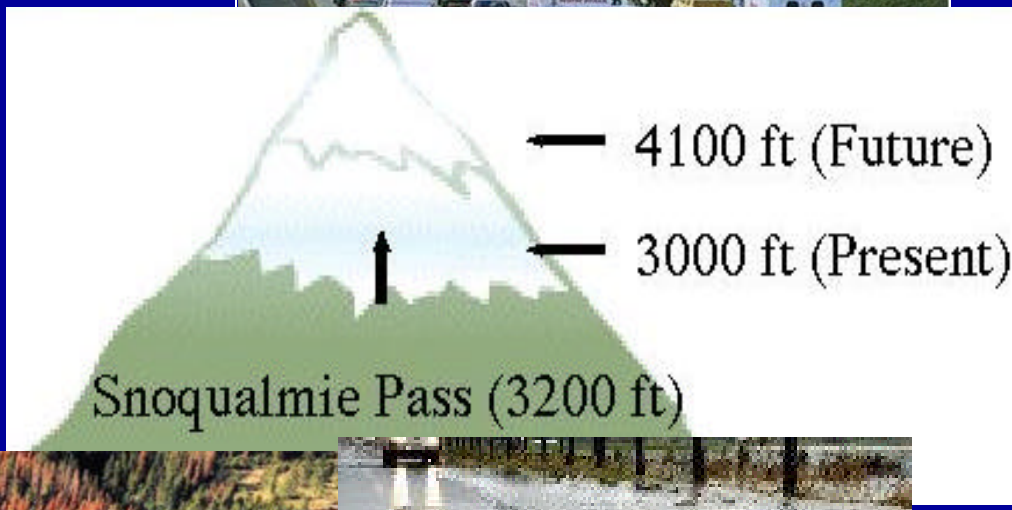
Sources: UCS, EIA, EPA, CEC, NESCAUM

“Global” warming is a local, state, and regional issue

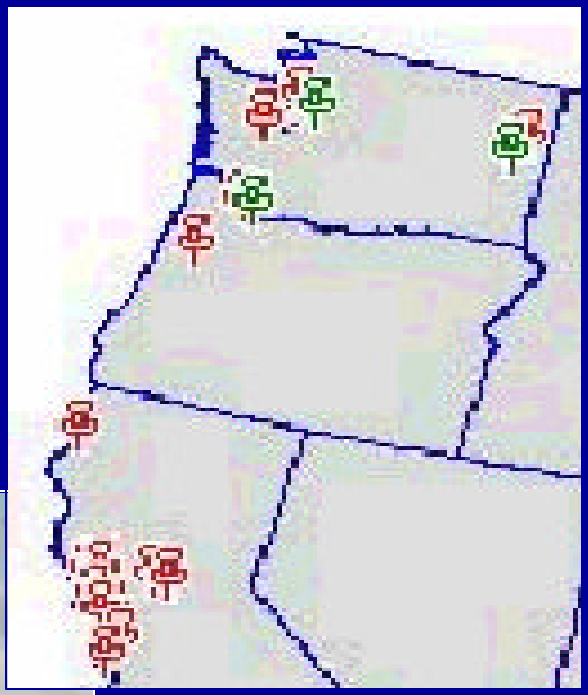
Causes: local and regional transportation and energy decisions

Impacts: local and regional resources, economies



“Global” warming is a local, state, and regional issue

Solutions: local and regional policy; energy innovation



Northwest clean energy leadership

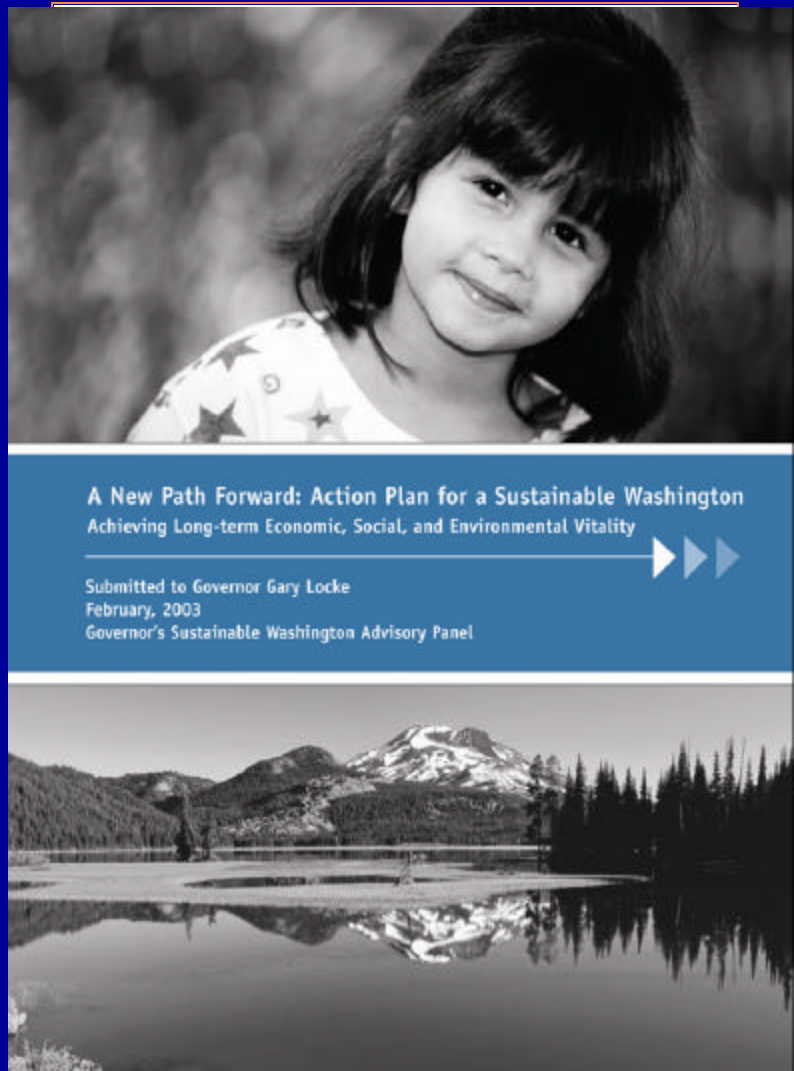
Why here?

Hard assets:

- Hydro system: “renewable edge;” efficiency leaders
- Clean energy enterprise
- Technology leadership

Disposition:

Proving ground for a new proserity



Local actions feed regional momentum, international resolve

- 2000 – City Light aims to zero out GHGs
  - Efficiency and renewables meet growth
  - Offsets establish carbon trading, seed biodiesel market
- 2003 – State adopts first climate policy
- 2003-4 West Coast Governors initiative
- 2004 – Clean Air Agency collaborative develops consensus agenda
- 2005 – Kyoto enters into force

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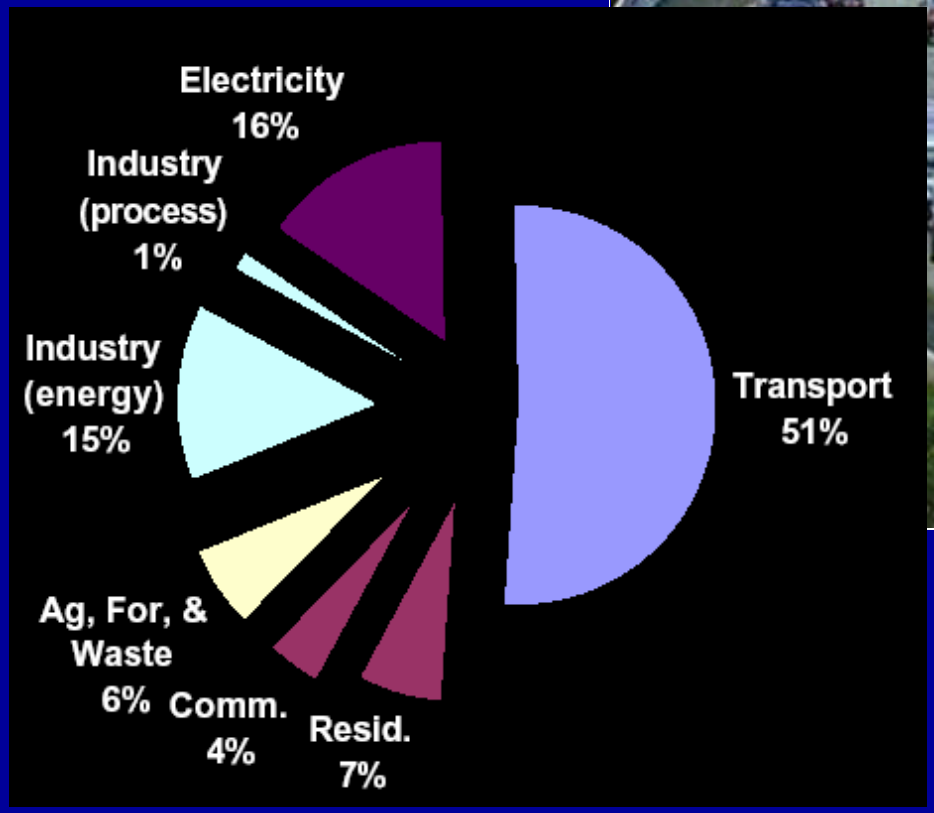
But as a community, our emissions continue to rise…



Climate Solutions

US Passenger Vehicles: *Global Role*

Leading CO_2 Emitters

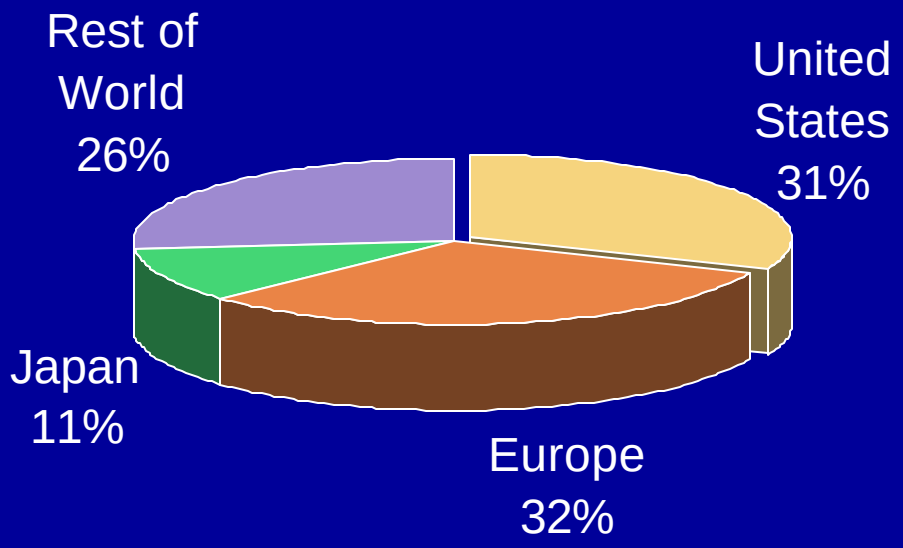
Nation	$MMTCO_2$
United States	**5,787**
China	**2,861**
Russia	**1,570**
Japan	**1,138**
India	**914**

Source: EIA 2004; EPA 2004

US Passenger Vehicles (1,072)

Source - UCS

Global Vehicle Market



Source: Wards 2003

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Clean Car Standards:

- Eight states have adopted Low Emission Vehicle (LEV II) standards.
  - Air quality benefits (esp. air toxics)
  - Consumer benefits, longer warranties
- New standards for global warming pollution deliver 30% reduction from new vehicles by 2016.
- Economic benefits:
  - Allocate air resources to the local economy.
  - Reduced fuel bills: > $2 billion by 2020.
  - Opportunities in clean car technology.
  - Transform North American auto market

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Going forward…..

- Set our sights; establish a results-oriented policy framework
- Engage the community
- Catalyze wider technology and policy changes
- Reduce dependence on fossil fuels
- Build our clean energy economy

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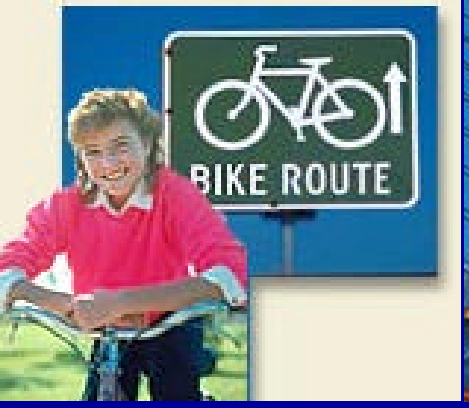
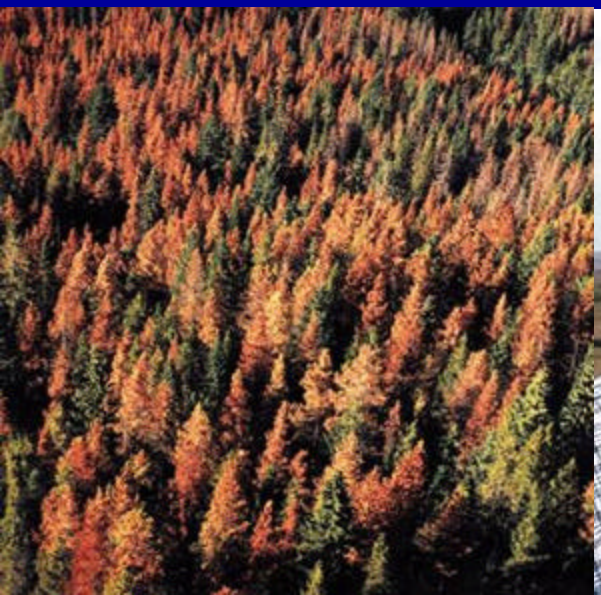


Climate Disruption

Science, solutions and prospects for local leadership



Green Ribbon Commission

March 29, 2005

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